

1 IN THE CLAIMS

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18 (New Claim) 132. A process for treating wood having wood cellulose having a plurality of hydroxyl
19 groups comprising the steps of:

20 providing a solution comprised of:

21 a solute compound having a plurality of functional groups wherein each of
22 which functional group includes;

23 an atom selected from the group consisting of tetravalent atoms, wherein said atom

1 is bonded to a halogen atom or a functional group selected from the group consisting of a hydroxyl
2 group, alkoxy group, phenoxy group, benzyloxy group, an aryloxy group having a polycyclic
3 aromatic ring, and combinations thereof; and

4 at least one acid catalyst;

5 applying said solution to the wood cellulose, and

6 an organic solvent allowing a solute compound to be drawn from the solute
7 to the wood by an acid generating reaction within the wood;

8 reacting said functional groups to form covalent bonds with other functional
9 groups of said solute and to said wood cellulose and wherein the acid catalyst is produced by a
10 molecule producing an acid after the application to water in the wood cellulose.

11 (New Claim) 133. The process according to claim 132 further comprising the step of reacting said
12 solute compound functional groups only upon contact with the wood cellulose or water in wood
13 cellulose..

14 (New Claim) 134. The process according to claim 133 further comprising the steps of simultaneous
15 reaction and diffusion of the functional groups in the wood and a heat generating reaction of said
16 functional groups upon application to the wood to form covalent bonds with other functional groups
17 of said solute and to said wood cellulose.

18 (New Claim) 135. The process of claim 134 wherein the acid catalyst comprises a substance which
19 reacts with water in the wood to generate acid in a heat generating reaction so that the functional
20 groups bonds from the, tetravalent atom across an oxygen of the cellulose hydroxyl group.

21 (New Claim) 136. The process of claim 135 wherein the acid catalyst is added to the wood
22 cellulose after application of said solution to the wood cellulose.

23 (New Claim) 137. The process of claim 135 wherein the acid catalyst is added to the solution

1 prior to application of the solution to the wood cellulose.

2 (New Claim)138. The process of claim132 wherein the acid catalyst is in the range of 0.05-10%
3 of the solution.

4 (New Claim) 139. The process of claim138 wherein the acid catalyst is in the range of 0.05-4.9%
5 of the solution.

6 (New Claim) 140. The process of claim 132 wherein the acid catalyst is strong acid.

7 (New Claim) 141. The process of claim 140 wherein the acid catalyst has a pKa below 2.5

8 (New Claim) 142. The process of claim 132 wherein the acid catalyst is in the range of .01-10%
9 in situ the wood.

10 (New Claim) 143. The process of claim 132 wherein the acid catalyst is a molecule
11 comprised of silicone and a halogen.

12 (New Claim) 144. The process of claim 132 wherein the concentration of organic solvents is in
13 the range from 0-20%.

14 (New Claim) 145. The process of claim 144 wherein the percentage of organic solvents is in a
15 range of 0 to 10%.

16 (New Claim) 146. The process of claim 132 wherein the organic solvent is at a concentration of
17 at least 10% of the solution.

18 (New Claim) 147. The process of claim 145 wherein organic solvents are at a concentration of
19 30%-99.9% of the solution.

20 (New Claim) 148. The process of claim 132 wherein the organic solution is less than 20%
21 oligomers of the functional groups prior to applying the solution to the wood.

22 (New Claim)149. The method of claim 132 wherein the organic solvent is an organic solvent with
23 a (K_{ow}) less than 10.0.

1 (New Claim) 150. The method of claim 149 wherein the organic solvent is an organic solvent with
2 a (K_{ow}) less than 1.0.

3 (New Claim) 151. The method of claim 150 wherein the organic solvent is an organic
4 solvent with a (K_{ow}) less than 0.

5 (New Claim) 152. The process of claim 132 further comprising the step of:

6 adding at least one non-reactive additive to the wood cellulose that enhances a desired
7 property selected from the group consisting of:

- 8 (1) fire resistance,
- 9 (2) insect resistance,
- 10 (3) moisture resistance,
- 11 (4) color,
- 12 (5) adhesion,
- 13 (6) insulation, and
- 14 (7) combinations thereof.

15 (New Claim) 153. The process of claim 152 wherein the step of adding at least one non-reactive
16 additive further comprises adding the additive to the solution.

17 (New Claim) 154. The process of claim 152 wherein the step of adding the at least one
18 non-reactive additive occurs before reacting the functional groups to bond with the wood cellulose

19 (New Claim) 155. The process of claim 152 wherein the additive is from the group
20 consisting of:

- 21 1) diatomaceous earth,
- 22 2) sodium silicates,
- 23 3) boron salts,

- 1 4) boric acid,
- 2 5) trimethy borate,
- 3 6) Boron Halides,
- 4 7) Boric Anhydride,
- 5 8) phosphorous compounds,
- 6 9) copper compounds,
- 7 10) metal alkoxide,
- 8 11) meta-phosphoric acid;
- 9 12) phosphoric acid,
- 10 13) metaphoshoric acid,
- 11 14) silicone salts
- 12 15) trialkyl borate
- 13 16) boron oxide, and
- 14 17) combinations thereof.

15 (Previously Presented) 156. The process according to claim 132, wherein the wood cellulose has an original
16 weight and wherein the duration of treatment attains a weight of compound which is covalently
17 bonded to the wood cellulose having a range of 0.1 to 10 weight percent of the original weight of
18 the wood cellulose.